AVR Trainer Kit User Manual

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About AVR Trainer Kit

AVR Trainer Kit is our oldest product offering.

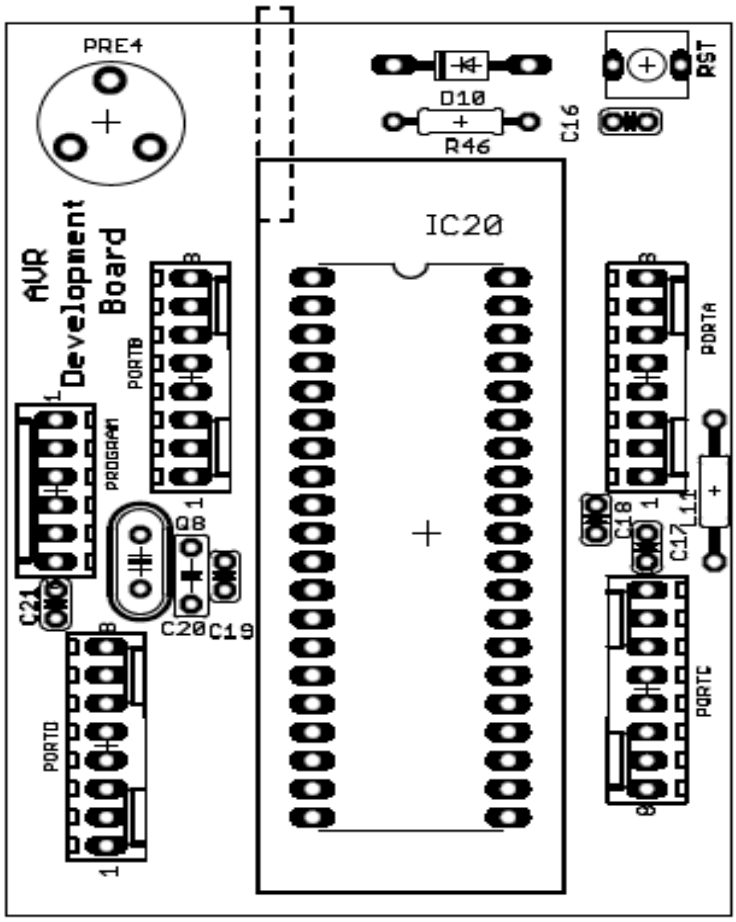
Since beginning of our Multiprocessor product range, our emphasis was always on offering AVR microcontroller support on single development board with variety of famous interface circuits.AVR Trainer Kit has always been a complete set of development system. ISP Programmers, IDEs, Compilers, Sample Source Code, Cables, Connectors and power supply are part of the standard packing. In export shipment, we do not include certain low cost – high weight accessories like cables. Power supplies are also not included as every country has unique wall mounting sockets.

Pin Diagrams of All Sections

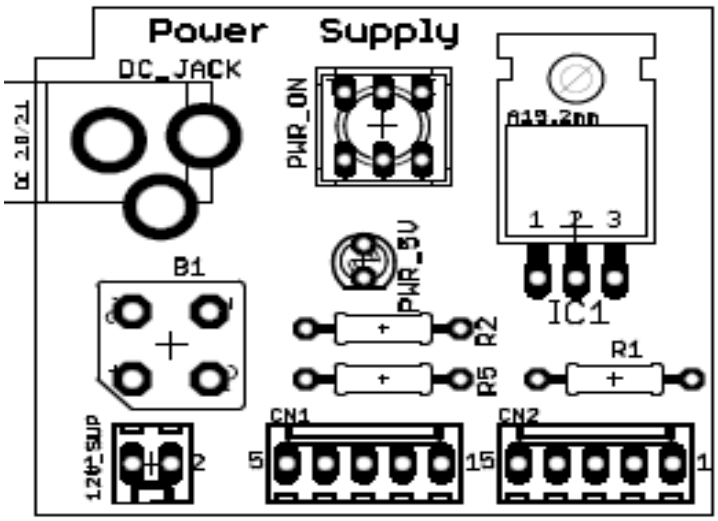
The AVR trainer kit includes following sections on the Board:

1. ATMega32 & other Pin compatible AVR Microcontrollers Development Board
2. Power Supply Section
3. LED Display
4. Seven Segment Display - Four multiplexed
5. LCD/GLCD Display
6. 4x4 Matrix Keypad
7. Pulled Up/Pulled Down Push to On Switches
8. Relay
9. ADC0808 Interface
10. ULN2803 Based Stepper Motor Driver
11. L298 Based DC Motor Driver
12. TSOP1738 Based Object Sensor
13. IR Photo Sensor
14. LM35 Temperature Sensor
15. 2 General Purpose RS232 Interface
16. 433Mhz RF Module with Encoder-Decoder
17. I2C Based Real time clock
18. SPI Based EEPROM
19. Variable resistors

1. **ATMega32 & other Pin compatible AVR Microcontrollers Development Board**

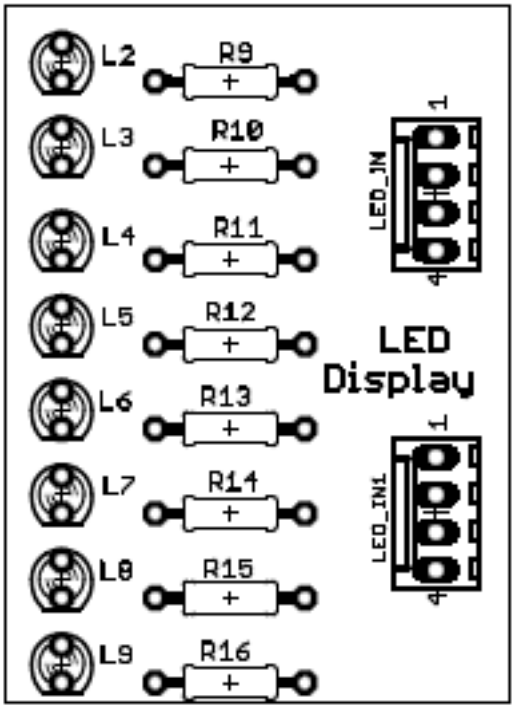


2. **Power Supply Section**



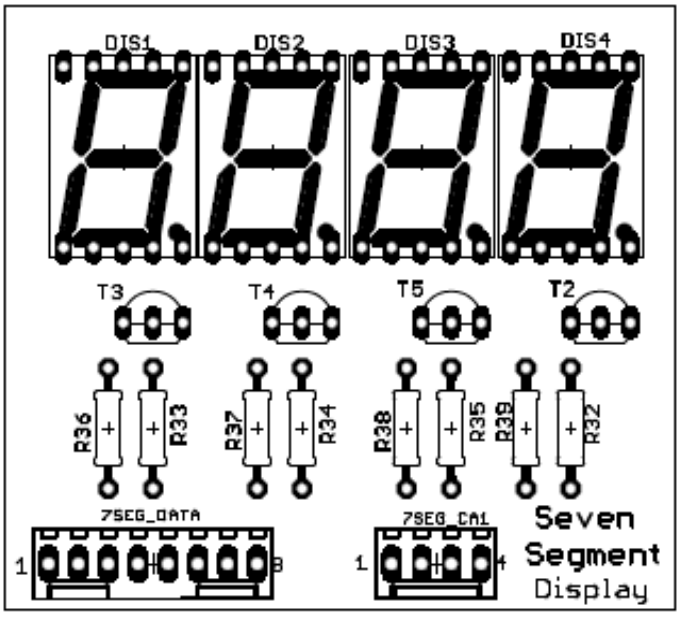
Note: Use only 9-12VDC, 1A Power Supply.

3. LED Display



LED_IN		LED_IN1	
1	L2	1	L6
2	L3	2	L7
3	L4	3	L8
4	L5	4	L9

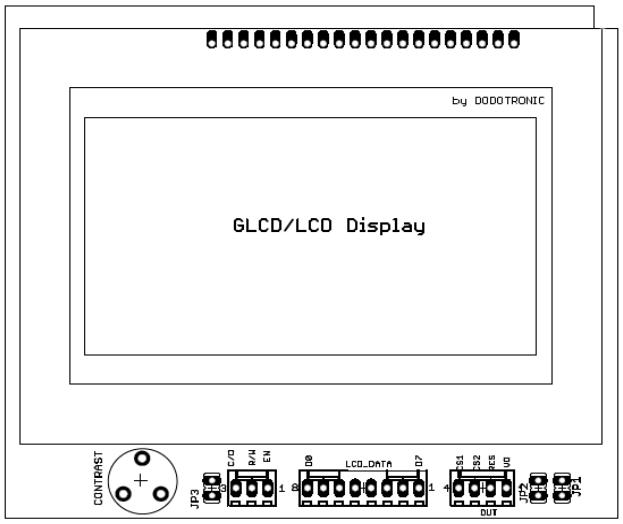
4. Seven Segment Display



7SEG_DATA		7SEG_CA1	
8	Seg A	4	DIS1
7	Seg B	3	DIS2
6	Seg C	2	DIS3
5	Seg D	1	DIS4
4	Seg E		
3	Seg F		
2	Seg G		
1	DP		

5. LCD/GLCD Display

A. Character LCD Connections



LCD_DATA		LCD_CTRL	
DB0	1	RS	C/D
DB1	2	RW	R/W
DB2	3	EN	EN
DB3	4	NC	CS1
DB4	5	NC	CS2
DB5	6	NC	RES
DB6	7	NC	V0
DB7	8		

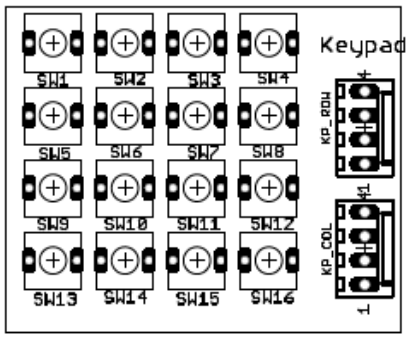
Note: Connect JP3,JP1 & JP2
for LCD Contrast & Back Light.

B. Graphics LCD Connections

LCD_DATA		LCD_CTRL	
1	DB0	RS	C/D
2	DB1	RW	R/W
3	DB2	EN	EN
4	DB3	CS1	CS1
5	DB4	CS2	CS2
6	DB5	+5V	RES
7	DB6	NC	V0
8	DB7		

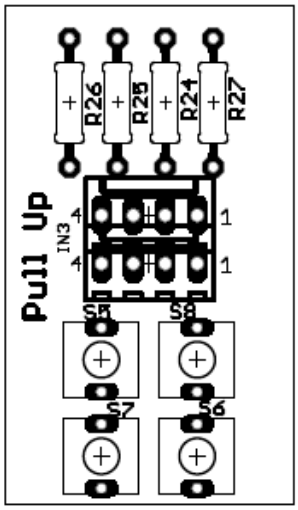
Note: Disconnect JP3, JP1 & JP2.

6. 4x4 Matrix Key

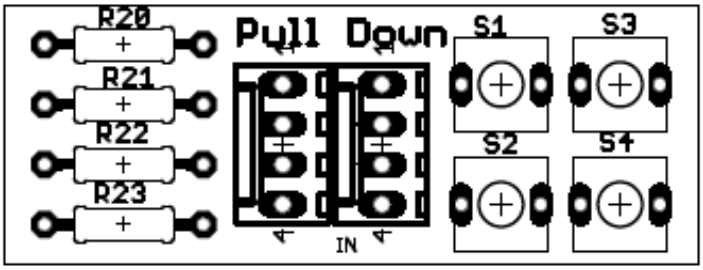


KP_ROW		KP_COL	
1	R1	1	C1
2	R2	2	C2
3	R3	3	C3
4	R4	4	C4

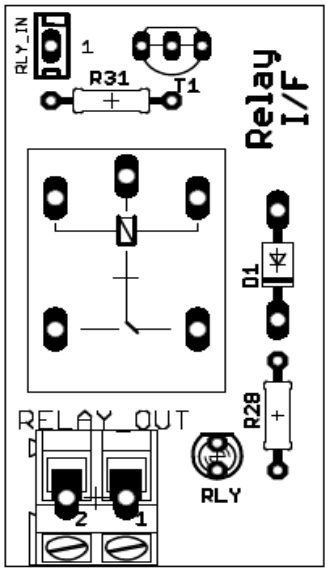
7. Pull Up/Pull Down Push to On Switches



Pull Up		Pull Down	
1	S5	1	S1
2	S6	2	S2
3	S7	3	S3
4	S8	4	S4

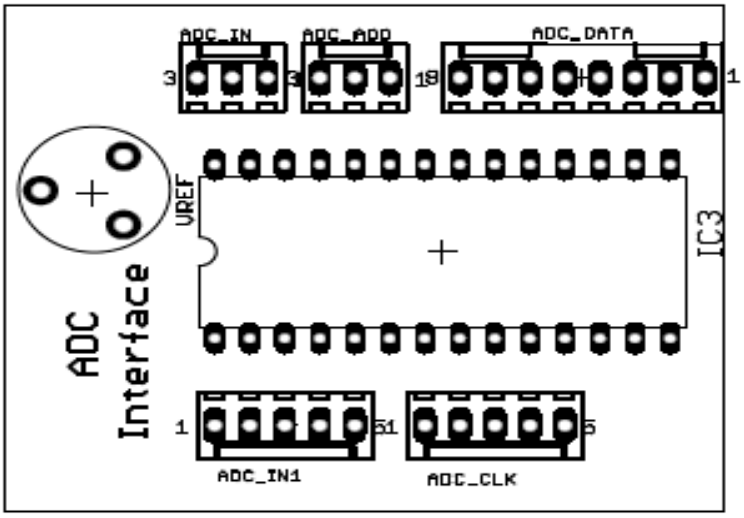


8. Relay Module



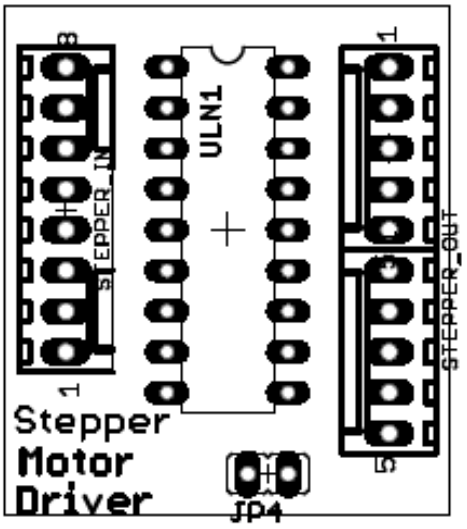
RELAY_OUT	
1	NO
2	NC

9. ADC0808 Interface



ADC_IN1		ADC_DATA	
1	IN3	1	D0
2	IN4	2	D1
3	IN5	3	D2
4	IN6	4	D3
5	IN7	5	D4
ADC_IN		6	D5
1	IN0	7	D6
2	IN1	8	D7
3	IN2	ADC_CLK	
ADC_ADD		1	SOC
1	ADD_C	2	EOC
2	ADD_B	3	ALE
3	ADD_A	4	OE
		5	CLK

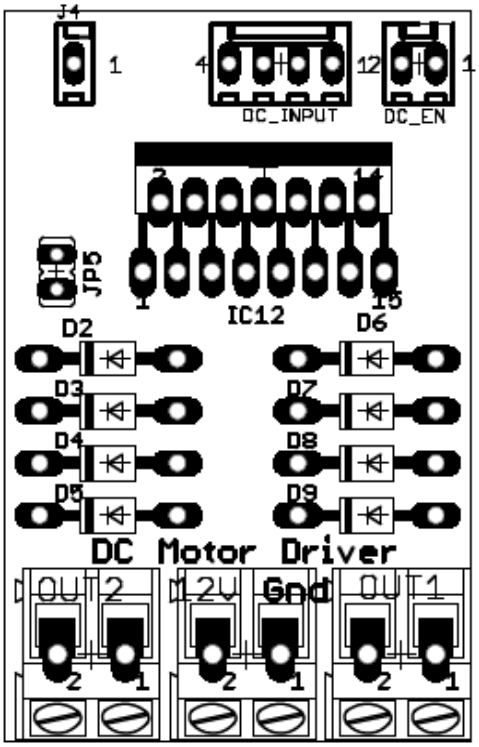
10. ULN2803 Based Stepper Motor Driver



STEPPER_IN		STEPPER_OUT	
1	IN8	1	O1
2	IN7	2	O2
3	IN6	3	O3
4	IN5	4	O4
5	IN4	5	CD
6	IN3	STEPPER_OUT1	
7	IN2	1	O5
8	IN1	2	O6
		3	O7
		4	O8
		5	CD

Note: Connect JP4 to supply 12V to the motor.

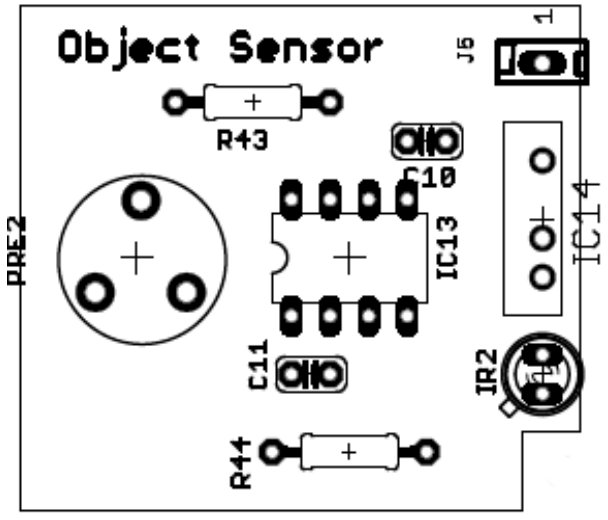
11. L298 Based DC Motor Driver



DC_INPUT		DMD_OUT1	
1	IN4	1	O1
2	IN3	2	O2
3	IN2	DMD_OUT2	
4	IN1	1	O4
DC_EN		2	O3
1	EN B	12V	
2	EN A	1	GND
J5		2	12V
1	12V		

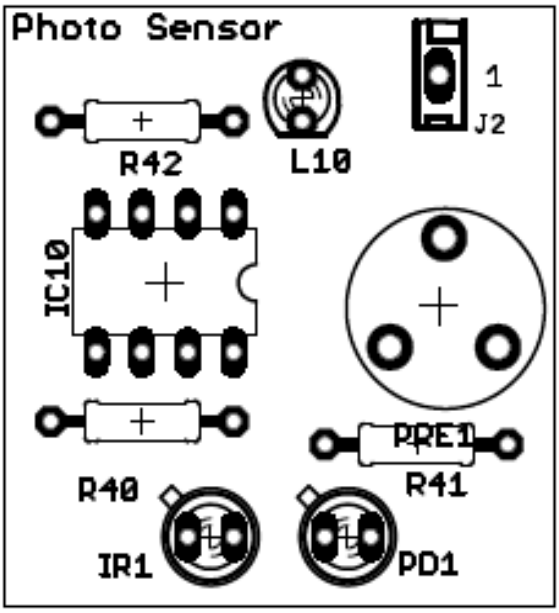
Note: Connect P4 supply 12V to Motor.

12. TSOP1738 Based Object Sensor



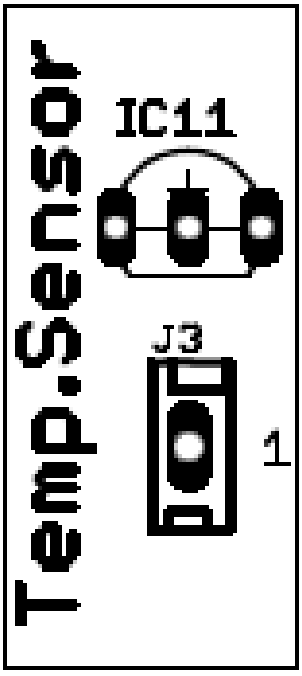
J5	
1	IR_OUT

13. <u>IR Photo Sensor</u>



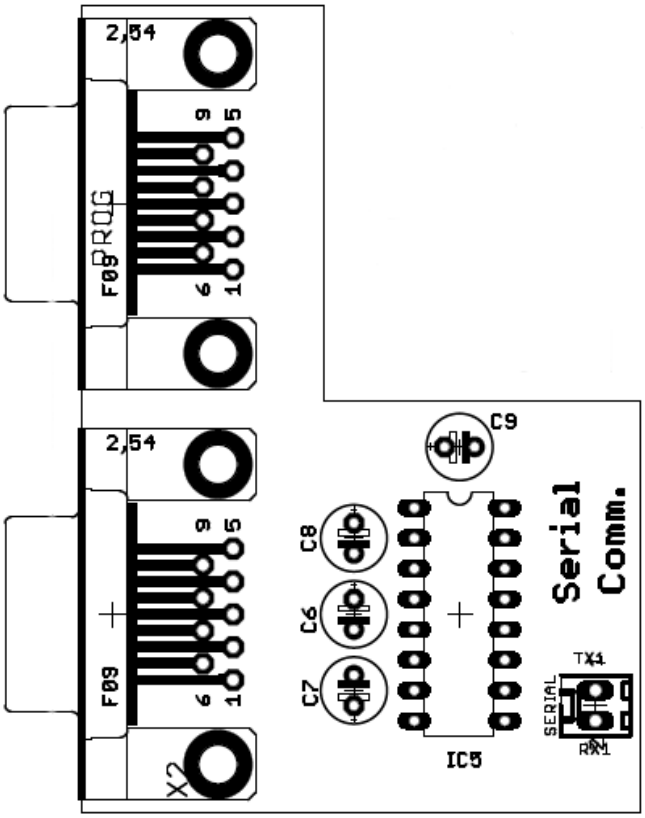
J2	
1	OUT

14. <u>LM35 Temperature Sensor</u>



J3	
1	OUT

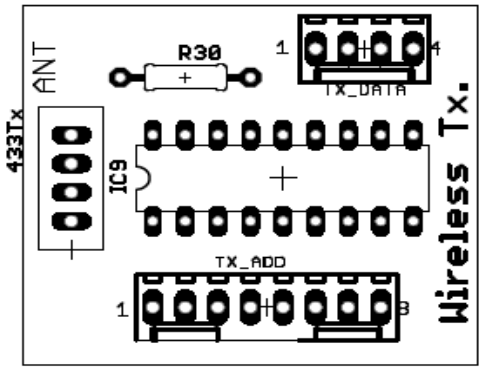
15. General Purpose RS232 Interface



SERIAL_PORT	
1	RX0
2	TX0
3	TX1
4	RX1

16. 433 MHz RF Module with Encoder-Decoder

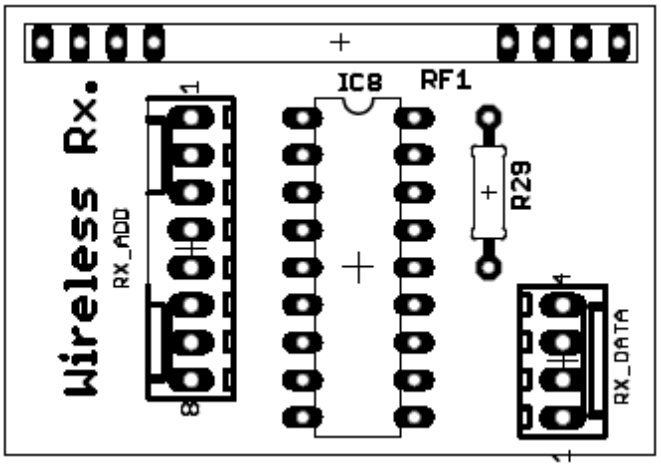
RF-Transmitter



TX_ADD		TX_DATA	
1	A0	1	D8
2	A1	2	D9
3	A2	3	D10
4	A3	4	D11
5	A4		
6	A5		
7	A6		
8	A7		

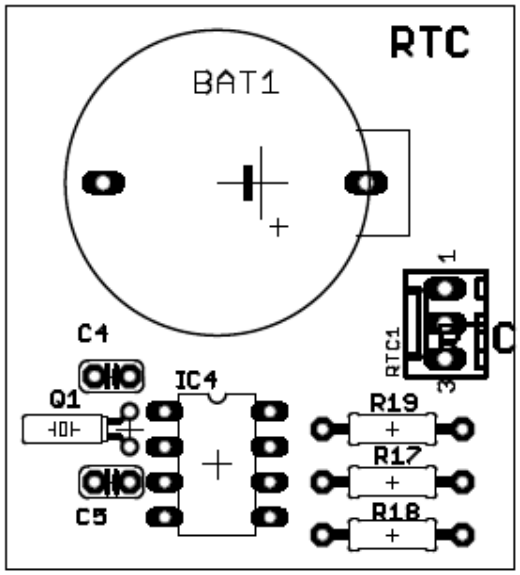
Note: JP7 Needs to be connected to enable transmission else you can connect to MCU.

RF Receiver



RX_ADD		RX_DATA	
1	A0	1	D8
2	A1	2	D9
3	A2	3	D10
4	A3	4	D11
5	A4	5	VT
6	A5		
7	A6		
8	A7		

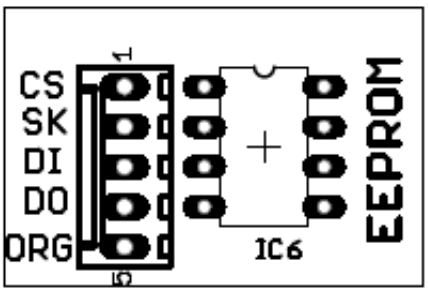
17. <u>I2C based Real Time Clock DS1307</u>



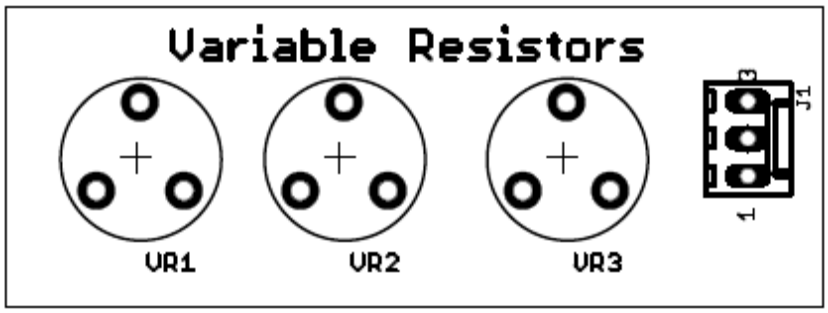
RTC1	
1	SQW
2	SCL
3	SDA

Note: Connect JP6 for VBAT Power.

18. <u>SPI EEPROM AT93C46</u>

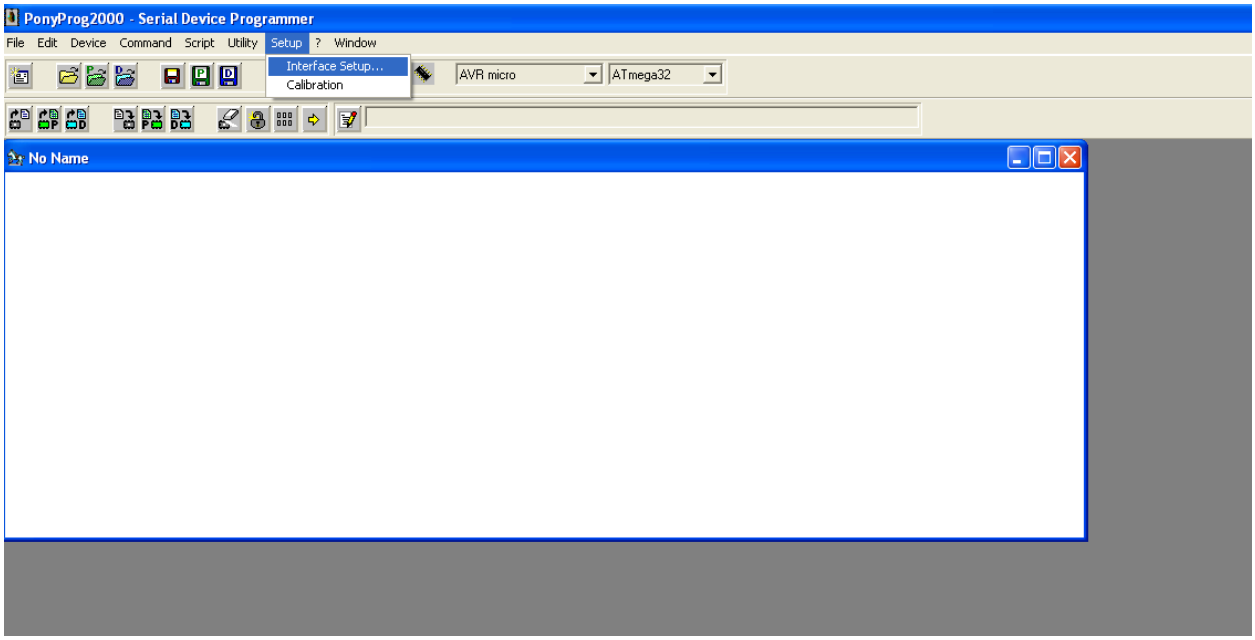


19. <u>Variable resistors</u>

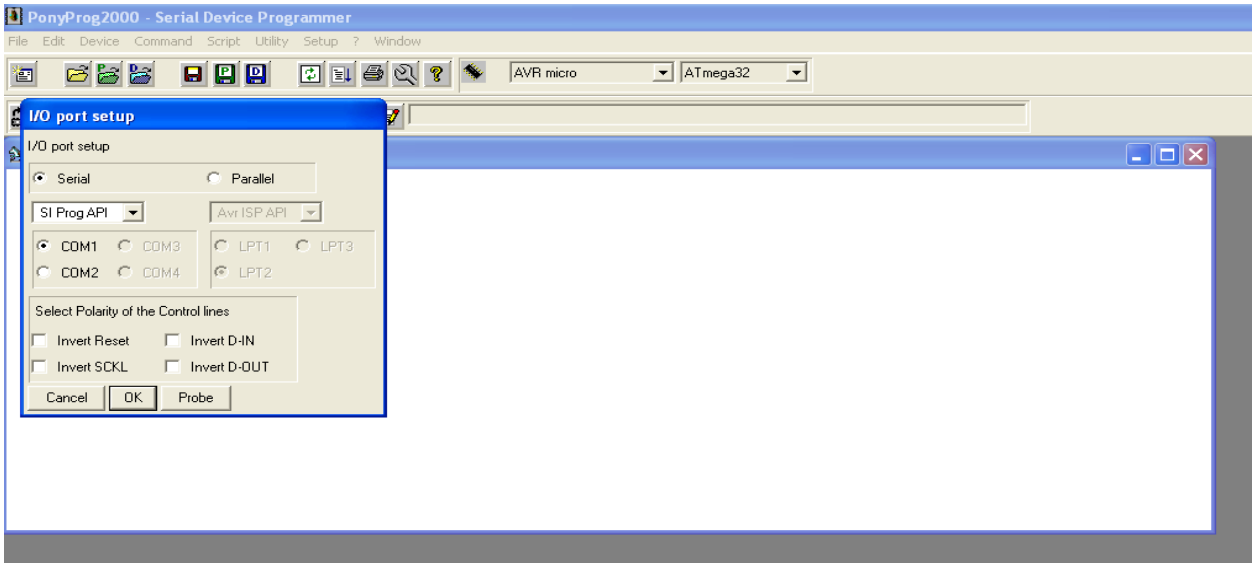


Programming AVR Atmega32 Microcontroller

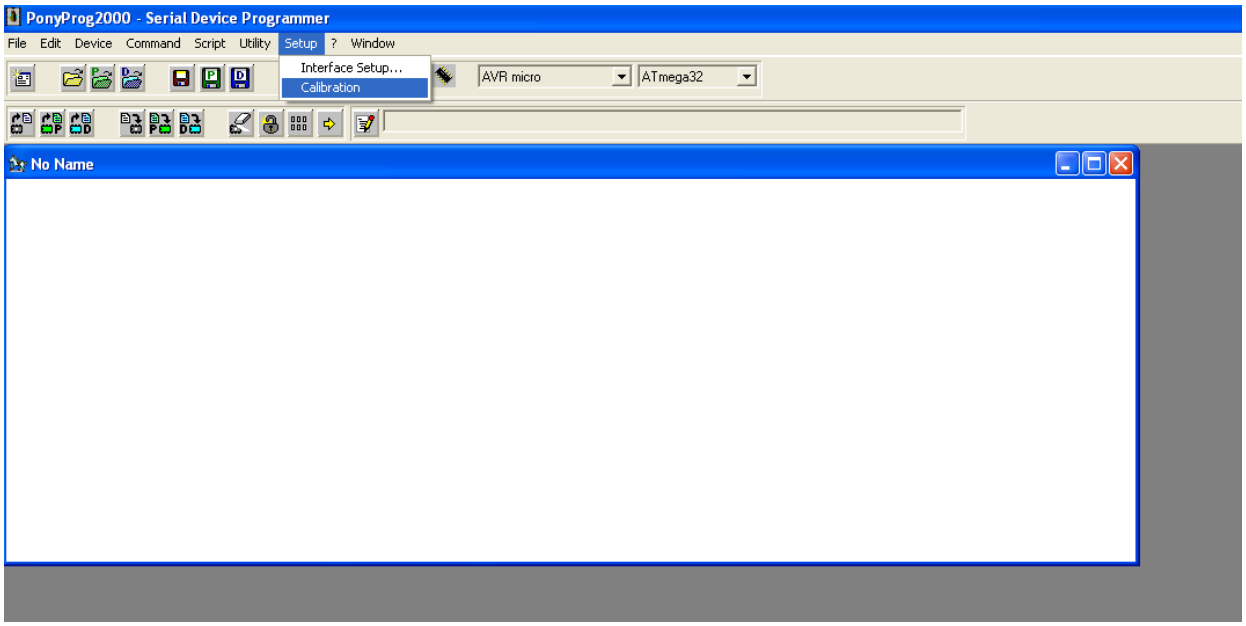
1. Open Pony Prog Software.
2. Connect AVRISP programmer's Pins to ISP Header for AVR on the Board.
3. Connect Serial Cable to AVRISP programmer.
4. Go to Setup Option from Main Menu.
5. Go to Interface Setup.



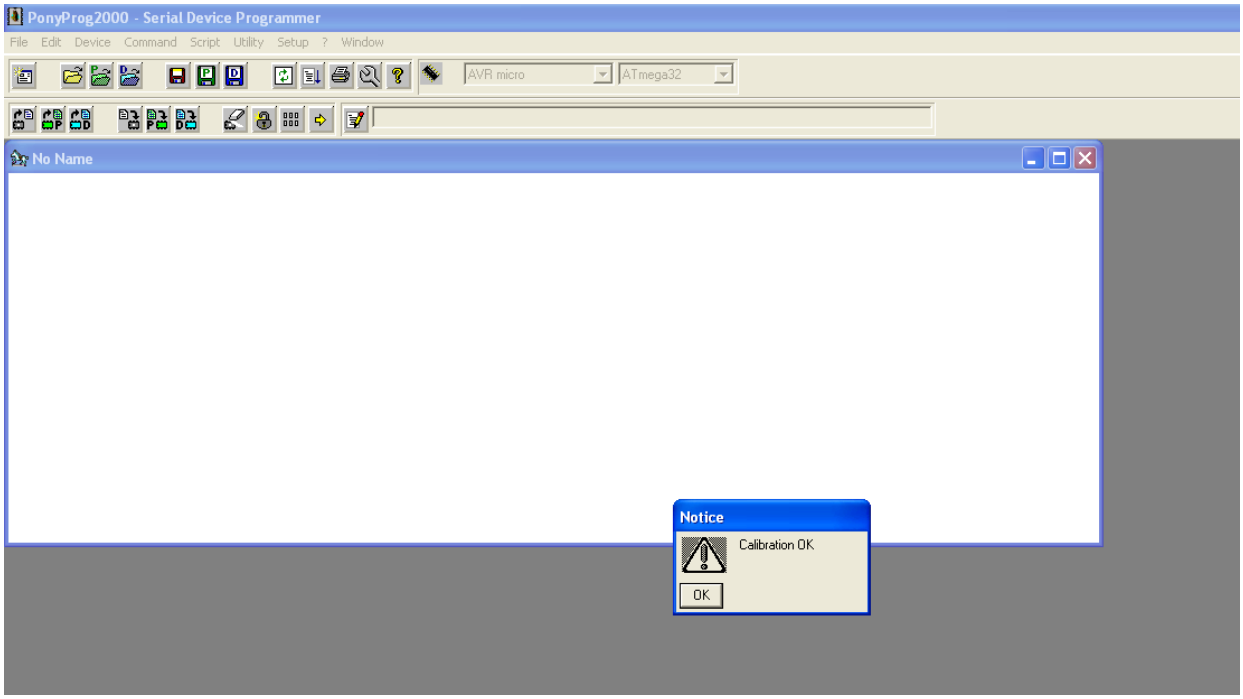
6. Select Serial IO option.
7. Select SIProg API and COM Port.



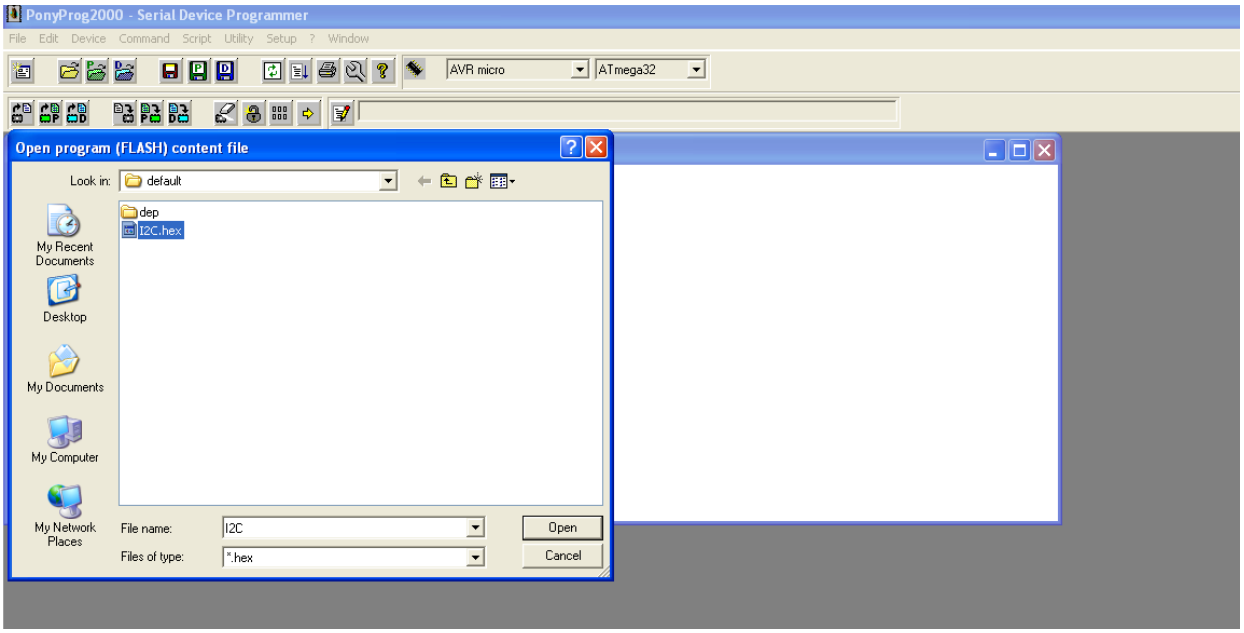
8. Click Probe Button it should Display Test OK.
9. Now Select Calibration option from Setup Menu.



10. Click on Yes and wait until it Displays Calibration Ok.



11. Now select ATmega32 from Device Menu.
12. Open Device File (Hex File) from file Menu.



13. Click Program option from Command Menu and wait until it finishes.
14. You can also change Fuse Bits from Command Menu -> Security & Configuration Bits.
    For fuse settings please refer to device datasheets.